

35 U.S.C. § 103

The Office Action rejected claims 1-20 under 35 U.S.C. § 103 over: (1) Hiroshi et al. (JP application no. 6-148661) (“Hiroshi”) in view of Shimada et al. (U.S. Patent No. 6,128,060) (“Shimada”) or Moshrefzadeh (U.S. Patent No. 6,037,005) (“Moshrefzadeh”); and (2) Shimkunas (U.S. Patent No. 4,696,878) (“Shimkunas”) or Moshrefzadeh in view of Shimada.

Applicants traverse those rejections for at least the following reasons.

Claims 1-20 are Patentable over Hiroshi in view of Shimada or Moshrefzadeh

At the outset, the second full paragraph of page 3 of the Office Action mentions “Sadoa” but Applicants respectfully do not see any other mention of any “Sadoa” reference in the Office Action, nor is any such reference included in the “Notice of References Cited.” From the context of the Office Action, Applicants believe that the Examiner meant to type “Hiroshi” instead of “Sadoa,” and Applicants will respond to the rejection under the assumption that the Examiner intended to reference “Hiroshi.” In the event that this understanding is not correct, Applicants request that the Examiner provide a clarification of the rejection and a new, non-Final Office Action with correct citations.

Also, in reviewing the rejection of claims 1-20 over Hiroshi in view of Shimada or Moshrefzadeh on page 3 of the Office Action, Applicants do not see any description of the supposed relevance of the Moshrefzadeh reference. If indeed, the Examiner intended to cite Moshrefzadeh in combination with Hiroshi, clarification is

respectfully requested.

Claim 1

Among other things, the method of claim 1 includes: (1) providing on the upper surface of each of the lines of transparent conducting material **a covering layer extending from an end part of a line** and partially covering the upper surface of the line, and (2) subjecting the lines to a metal electroplating process in which a plating potential is **applied to each line at the end part**.

Applicants respectfully submit that no such feature is disclosed in Hiroshi, Shimada, or Moshrefzadeh. Applicants have reviewed the cited FIGs. 1-2 in Hiroshi and see nothing that would indicate or even suggest that a covering layer **extends from an end part** of a line, or that a plating potential is **applied to each line at the end part**.

Shimada has apparently only been cited as showing the structure of various components of an active matrix device which are not specifically recited in the method of claim 1. So, Applicants respectfully submit that the above-mentioned features of claim 1 do not appear in Shimada either.

Also, the Office Action failed to explain at all how it is proposed to combine Hiroshi with Moshrefzadeh. In any event, Moshrefzadeh fails even to show any lines of transparent conducting material (the layer 22 is apparently a continuous layer that is later patterned into pixels). Moreover, the metal coating 26 in Moshrefzadeh is not electroplated onto layer 22, but instead, Moshrefzadeh specifically teaches that:

“A metal coating 26 is then deposited over the substrate as shown in FIG. 1(c).”

Moshrefzadeh at col. 5, lines 35-36.

Furthermore, Applicants respectfully traverse the proposed combination of Hiroshi and Shimada or Moshrefzadeh as lacking any motivation or suggestion whatsoever in the prior art. The Office Action fails to cite anything in the prior art that suggests applying the process of Hiroshi to Shimada (or Moshrefzadeh) would “provide a liquid crystal device having a sufficiently small deviation among threshold characteristics of thin film transistor.”

Therefore, no possible combination of the teachings of Hiroshi, Shimada, or Moshrefzadeh could produce the method of claim 1 including the features of providing on the upper surface of each of the lines of transparent conducting material a covering layer extending from an end part of a line and partially covering the upper surface of the line, and subjecting the lines to a metal electroplating process in which a plating potential is applied to each line at the end part.

Accordingly, for at least the foregoing reasons, Applicants respectfully submit that the method of claim 1 is patentable over Hiroshi, Shimada, and Moshrefzadeh.

Claims 2-10 and 16-20

Claims 2-10 and 16-20 depend variously from claim 1 and are deemed patentable for at least the reasons set forth above with respect to claim 1, and for the

following additional reasons.

Claim 2

Among other things, in the method of claim 2, the covering layer is shaped such that the exposed surface of the line increases progressively away from the end part.

The Office Action makes no mention whatsoever of this feature. **The Office Action fails to cite a single sentence or reference number in any of the cited references that allegedly discloses such a feature. Applicants respectfully request that the Examiner provide some citation to a prior art reference that discloses the features of claim 2, or allow the claim.**

Claim 3

Among other things, in the method of claim 3, the covering layer tapers in width away from the end part.

The Office Action makes no mention whatsoever of this feature. **The Office Action fails to cite a single sentence or reference number in any of the cited references that allegedly discloses such a feature. Applicants respectfully request that the Examiner provide some citation to a prior art reference that discloses the features of claim 3, or allow the claim.**

Claim 4

Among other things, in the method of claim 4, the covering layer is stepped in width along the line.

The Office Action makes no mention whatsoever of this feature. **The Office**

Action fails to cite a single sentence or reference number in any of the cited references that allegedly discloses such a feature. Applicants respectfully request that the Examiner provide some citation to a prior art reference that discloses the features of claim 4, or allow the claim.

Claim 5

Among other things, in the method of claim 5, the covering layer extends from both ends of the line in similar manner and the plating potential is applied at both ends of the line during the plating process.

The Office Action makes no mention whatsoever of these features. **The Office Action fails to cite a single sentence or reference number in any of the cited references that allegedly discloses such a feature. Applicants respectfully request that the Examiner provide some citation to a prior art reference that discloses the features of claim 5, or allow the claim.**

Claim 8

Among other things, in the method of claim 8, the step of forming the lines comprises: depositing a layer of transparent conducting material over the substrate, depositing a photoresist layer over the layer of transparent conducting material and patterning the photoresist into a configuration corresponding to the desired lines, and patterning the transparent conducting layer using the photoresist to leave the lines of transparent conducting material, and **the photoresist layer is patterned** into portions corresponding to the desired lines with each portion **including a selected region having a first thickness and conforming with the form of the**

required covering layer with the remainder of the portion being of reduced thickness, and after patterning the transparent conducting layer the photoresist is partially etched to remove the areas of reduced thickness while leaving photoresist at the selected region which photoresist constitutes the covering layer.

The Office Action makes no mention whatsoever of these features. Indeed, from inspection of Hiroshi, it appears that the photoresist layer 3 is deposited over the ITO areas 2 with a single, uniform thickness. The Office Action fails to cite a single sentence or reference number in any of the cited references that allegedly discloses such features. Applicants respectfully request that the Examiner provide some citation to a prior art reference that discloses the features of claim 8, or allow the claim.

Claim 17

Among other things, in the method of claim 17, photoresist is left over pixel electrode regions during the electroplating process.

The Office Action makes no mention whatsoever of these features. The Office Action fails to cite a single sentence or reference number in any of the cited references that allegedly discloses such a feature. Applicants respectfully request that the Examiner provide some citation to a prior art reference that discloses the features of claim 5, or allow the claim.

Claim 11

Among other things, the method of claim 11 includes: (1) defining a photoresist to leave a photoresist region on each conductor line extending from one

end part of the line partially covering the surface of the line, and (2) selectively electroplating the exposed areas of the transparent conductor lines with a metallic layer **with a plating potential being applied at the end part of each line.**

Applicants respectfully submit that no such features are disclosed in Hiroshi, Shimada, or Moshrefzadeh. Applicants have reviewed the cited FIGs. 1-2 in Hiroshi and see nothing that would indicate or even suggest that the photoresist layer 3 **extends from an end part** of a line, or that a plating potential is applied **at the end part of each line.**

Shimada has apparently only been cited as showing the structure of various components of an active matrix device. So, Applicants respectfully submit that the above-mentioned features of claim 11 do not appear in Shimada either.

Also, as explained above with respect to claim 1, the Office Action failed to explain at all how it is proposed to combine Hiroshi with Moshrefzadeh, and, in any event, Moshrefzadeh teaches that the metal coating 26 in Moshrefzadeh is **not electroplated** onto layer 22, but instead is deposited over the substrate.

Furthermore, as explained above with respect to claim 1, Applicants respectfully traverse the proposed combination of Hiroshi and Shimada or Moshrefzadeh as lacking any motivation or suggestion whatsoever in the prior art.

Therefore, no possible combination of the teachings of in Hiroshi, Shimada, or Moshrefzadeh suggest the method of claim 11 including the features of defining a photoresist to leave a photoresist region on each conductor line extending from one end part of the line partially covering the surface of the line, and selectively

electroplating the exposed areas of the transparent conductor lines with a metallic layer with a plating potential being applied at the end part of each line.

Accordingly, for at least the foregoing reasons, Applicants respectfully submit that the method of claim 11 is patentable over Hiroshi, Shimada, and Moshrefzadeh.

Claims 12-13 and 15

Claims 12-13 and 15 depend from claim 11 and are deemed patentable for at least the reasons set forth above with respect to claim 11, and for the following additional reasons.

Claim 12

Among other things, in the method of claim 12, the photoresist layer is patterned into areas of different thicknesses at the conductor lines, and the step of defining the photoresist comprises partially etching the photoresist to remove the thinner areas.

The Office Action makes no mention whatsoever of these features. **The Office Action fails to cite a single sentence or reference number in any of the cited references that allegedly discloses such features. Applicants respectfully request that the Examiner provide some citation to a prior art reference that discloses the features of claim 12, or allow the claim.**

Claims 13 and 15

Among other things, in the methods of claims 13 and 15, the photoresist is defined to leave on each line a similar photoresist region extending from the other end part and wherein the plating potential is applied also at that other end part.

The Office Action makes no mention whatsoever of this feature. **The Office Action fails to cite a single sentence or reference number in any of the cited references that allegedly discloses such a feature. Applicants respectfully request that the Examiner provide some citation to a prior art reference that discloses the features of claims 13 and 15, or allow the claims.**

Claim 14

Among other things, the display device of claim 14 includes an active plate made according to the method of claim 11. As explained above, no possible combination of the teachings of in Hiroshi, Shimada, or Moshrefzadeh could produce the method of claim 11. Therefore, they also could not produce the display device of claim 14.

Accordingly, for at least the foregoing reasons, Applicants respectfully submit that the device of claim 14 is patentable over Hiroshi, Shimada, and Moshrefzadeh.

Claims 1-20 are Patentable over Shimkunas in view of Shimada

Claim 1

Among other things, the method of claim 1 includes: (1) providing on the upper surface of each of the lines of transparent conducting material **a covering layer extending from an end part of a line** and partially covering the upper surface of the line, and (2) subjecting the lines to a metal electroplating process in which a plating potential is **applied to each line at the end part**.

Applicants respectfully submit that no such feature is disclosed in Shimkunas

or Shimada. Applicants have reviewed the cited FIGs. 4a-4g in Shimkunas and see nothing that would indicate or even suggest that a covering layer **extends from an end part** of a line, or that a plating potential is **applied to each line at the end part**.. Indeed, Applicants see nothing in Shimkunas that even discloses or suggests that any **lines** are formed on the substrate 101.

Shimada has apparently only been cited as showing the structure of various components of an active matrix device which are not specifically recited in the method of claim 1. So, Applicants respectfully submit that the above-mentioned features of claim 1 do not appear in Shimada either.

Furthermore, Applicants respectfully traverse the proposed combination of Shimkunas and Shimada as lacking any motivation or suggestion whatsoever in the prior art. The Office Action fails to cite anything in the prior art that suggests applying the process of Shimkunas and Shimada would “provide a liquid crystal device having a sufficiently small deviation among threshold characteristics of thin film transistor.” Additionally, Shimkunas teaches a method of making an X-Ray photolithography mask. Shimkunas does not disclose any process for making lines on any substrate for a display or semiconductor device, or anything of the sort. Shimkunas’ mask does not even have any thin film transistors, nor does it teach anything about any threshold voltages for any thin film transistors.

Applicants can imagine no motivation other than Applicants’ own disclosure that would motivate one to cobble together any parts of Shimkunas and Shimada to try to produce the method of claim 1.

Therefore, no possible combination of the teachings of Shimkunas and Shimada could produce the method of claim 1 including the features of providing on the upper surface of each of the lines of transparent conducting material a covering layer extending from an end part of a line and partially covering the upper surface of the line, and subjecting the lines to a metal electroplating process in which a plating potential is applied to each line at the end part.

Accordingly, for at least the foregoing reasons, Applicants respectfully submit that the method of claim 1 is patentable over Shimkunas and Shimada.

Claims 2-10 and 16-20

Claims 2-10 and 16-20 depend variously from claim 1 and are deemed patentable for at least the reasons set forth above with respect to claim 1, and for the following additional reasons.

As explained above with respect to the rejection of claims 2-10 and 16-20 over the combination of Hiroshi, Shimada, and Moshrefzadeh, claims 2-10 and 16-20 recite numerous specific features which are not even mentioned anywhere in the Office Action. Applicants respectfully request a citation to something in Shimkunas and Shimada that supposedly discloses these features, or a withdrawal of their rejection over Shimkunas and Shimada.

Claim 11

Among other things, the method of claim 11 includes: (1) defining a photoresist to leave a photoresist region on each conductor line **extending from one end part of the line** partially covering the surface of the line, and (2) selectively

electroplating the exposed areas of the transparent conductor lines with a metallic layer **with a plating potential being applied at the end part of each line.**

Applicants respectfully submit that no such features are disclosed in Shimkunas or Shimada. Applicants have reviewed the cited FIGs. 4a-4g in Shimkunas and see nothing that would indicate or even suggest that the photoresist layer 3 **extends from an end part** of a line, or that a plating potential is applied **at the end part of each line.**

Shimada has apparently only been cited as showing the structure of various components of an active matrix device. So, Applicants respectfully submit that the above-mentioned features of claim 11 do not appear in Shimada either.

Furthermore, as explained above with respect to claim 1, Applicants respectfully traverse the proposed combination Shimkunas and Shimada as lacking any motivation or suggestion whatsoever in the prior art.

Therefore, no possible combination of the teachings of in Shimkunas and Shimada can produce the method of claim 11 including the features of defining a photoresist to leave a photoresist region on each conductor line extending from one end part of the line partially covering the surface of the line, and selectively electroplating the exposed areas of the transparent conductor lines with a metallic layer with a plating potential being applied at the end part of each line.

Accordingly, for at least the foregoing reasons, Applicants respectfully submit that the method of claim 11 is patentable over Shimkunas and Shimada.

Claims 12-13 and 15

Claims 12-13 and 15 depend from claim 11 and are deemed patentable for at least the reasons set forth above with respect to claim 11, and for the following additional reasons.

As explained above with respect to the rejection of claims 12-13 and 15 over the combination of Shimkunas and Shimada, claims 12-13 and 15 recite numerous specific features which are not even mentioned anywhere in the Office Action.

Applicants respectfully request a citation to something in Shimkunas and Shimada that supposedly discloses these features, or a withdrawal of their rejection over Shimkunas and Shimada.

Claim 14

Among other things, the display device of claim 14 includes an active plate made according to the method of claim 11. As explained above, no possible combination of the teachings of in Shimkunas and Shimada could produce the method of claim 11. Therefore, they also could not produce the display device of claim 14.

Accordingly, for at least the foregoing reasons, Applicants respectfully submit that the device of claim 14 is patentable over Shimkunas and Shimada.

Claims 1-20 are Patentable over Moshrefzadeh in view of ShimadaClaim 1

Among other things, the method of claim 1 includes **subjecting the lines to a metal electroplating process** in which a plating potential is applied to each line at the

end part.

Applicants respectfully submit that no such feature is disclosed in Moshrefzadeh or Shimada. Moshrefzadeh fails even to show any lines of transparent conducting material (the layer 22 is apparently a continuous layer that is later patterned into pixels). Moreover, the metal coating 26 in Moshrefzadeh is not electroplated onto layer 22, but instead, Moshrefzadeh specifically teaches that:

“A metal coating 26 is then **deposited over the substrate** as shown in FIG. 1(c).”

Moshrefzadeh at col. 5, lines 35-36.

Shimada has apparently only been cited as showing the structure of various components of an active matrix device which are not specifically recited in the method of claim 1. So, Applicants respectfully submit that the above-mentioned features of claim 1 do not appear in Shimada either.

Furthermore, Applicants respectfully traverse the proposed combination of Moshrefzadeh and Shimada as lacking any motivation or suggestion whatsoever in the prior art. The Office Action fails to cite anything in the prior art that suggests applying the process of Moshrefzadeh to Shimada would “provide a liquid crystal device having a sufficiently small deviation among threshold characteristics of thin film transistor.”

Therefore, no possible combination of the teachings of Moshrefzadeh and

Shimada could produce the method of claim 1 including the feature of includes subjecting the lines to a metal electroplating process in which a plating potential is applied to each line at the end part.

Accordingly, for at least the foregoing reasons, Applicants respectfully submit that the method of claim 1 is patentable over Moshrefzadeh and Shimada.

Claims 2-10 and 16-20

Claims 2-10 and 16-20 depend variously from claim 1 and are deemed patentable for at least the reasons set forth above with respect to claim 1, and for the following additional reasons.

As explained above with respect to the rejection of claims 2-10 and 16-20 over the combination of Hiroshi, Shimada, and Moshrefzadeh, claims 2-10 and 16-20 recite numerous specific features which are not even mentioned anywhere in the Office Action. Applicants respectfully request a citation to something in Moshrefzadeh and Shimada that supposedly discloses these features, or a withdrawal of their rejection over Moshrefzadeh and Shimada.

Claim 11

Among other things, the method of claim 11 includes selectively **electroplating the exposed areas of the transparent conductor lines** with a metallic layer with a plating potential being applied at the end part of each line.

Applicants respectfully submit that no such features are disclosed in Moshrefzadeh or Shimada. As explained above, Moshrefzadeh teaches that the metal coating 26 in Moshrefzadeh is not electroplated onto layer 22, but instead is **deposited**

over the substrate.

Shimada has apparently only been cited as showing the structure of various components of an active matrix device. So, Applicants respectfully submit that the above-mentioned features of claim 11 do not appear in Shimada either.

Furthermore, as explained above with respect to claim 1, Applicants respectfully traverse the proposed combination of Moshrefzadeh and Shimada as lacking any motivation or suggestion whatsoever in the prior art.

Therefore, no possible combination of the teachings of in Moshrefzadeh and Shimada can produce the method of claim 11 including the features of defining a photoresist to leave a photoresist region on each conductor line extending from one end part of the line partially covering the surface of the line, and selectively electroplating the exposed areas of the transparent conductor lines with a metallic layer with a plating potential being applied at the end part of each line.

Accordingly, for at least the foregoing reasons, Applicants respectfully submit that the method of claim 11 is patentable over Moshrefzadeh and Shimada.

Claims 12-13 and 15

Claims 12-13 and 15 depend from claim 11 and are deemed patentable for at least the reasons set forth above with respect to claim 11, and for the following additional reasons.

As explained above with respect to the rejection of claims 12-13 and 15 over the combination of Moshrefzadeh and Shimada, claims 12-13 and 15 recite numerous specific features which are not even mentioned anywhere in the Office Action.

Applicants respectfully request a citation to something in Moshrefzadeh and Shimada that supposedly discloses these features, or a withdrawal of their rejection over Moshrefzadeh and Shimada.

Claim 14

Among other things, the display device of claim 14 includes an active plate made according to the method of claim 11. As explained above, no possible combination of the teachings of in Moshrefzadeh and Shimada could produce the method of claim 11. Therefore, they also could not produce the display device of claim 14.

Accordingly, for at least the foregoing reasons, Applicants respectfully submit that the device of claim 14 is patentable over Shimkunas and Shimada.

CONCLUSION

In view of the foregoing explanations, Applicants respectfully request that the Examiner reconsider and reexamine the present application, allow claims 1-20, and pass the application to issue. In the event that there are any outstanding matters remaining in the present application, the Examiner is invited to contact Kenneth D. Springer (Reg. No. 39,843) at (703) 715-0870 to discuss these matters.

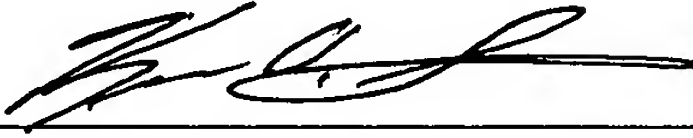
If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies to charge payment or credit any overpayment to Deposit Account No. 50-0238 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. §

1.17, particularly extension of time fees.

Respectfully submitted,

VOLENTINE FRANCOS, P.L.L.C.

Date: 13 June 2003

By: 

Kenneth D. Springer
Registration No. 39,843

VOLENTINE FRANCOS, P.L.L.C.
12200 Sunrise Valley Drive, Suite 150
Reston, Virginia 20191
Telephone No.: (703) 715-0870
Facsimile No.: (703) 715-0877